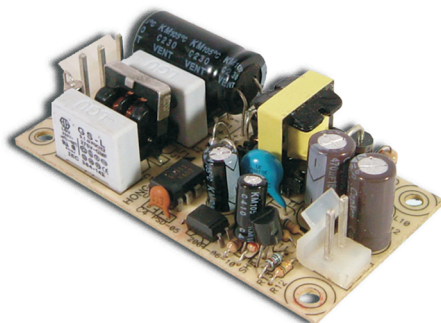




5W Single Output Switching Power Supply

PS-05 series



■ Features :

- Universal AC input / Full range
- Low leakage current <0.5mA
- Protections: Short circuit/Over load /Over voltage/Over temperature
- Cooling by free air convection
- 100% full load burn-in test
- Fix switching frequency at 67KHz
- Low cost
- High reliability
- 2 years warranty

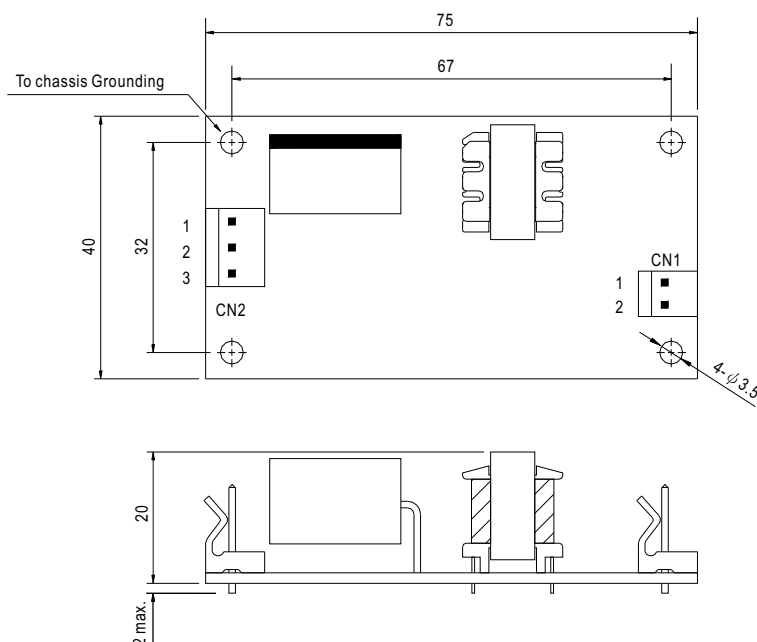
CBCE

SPECIFICATION

MODEL		PS-05-5	PS-05-12	PS-05-15	PS-05-24	PS-05-48
OUTPUT	DC VOLTAGE	5V	12V	15V	24V	48V
	RATED CURRENT	1A	0.45A	0.35A	0.22A	0.11A
	CURRENT RANGE	0 ~ 1.2A	0 ~ 0.5A	0 ~ 0.4A	0 ~ 0.25A	0 ~ 0.125A
	RATED POWER	5W	5.4W	5.25W	5.28W	5.28W
	RIPPLE & NOISE (max.) Note.2	100mVp-p	120mVp-p	120mVp-p	200mVp-p	200mVp-p
	VOLTAGE TOLERANCE Note.3	±2.0%	±2.0%	±2.0%	±2.0%	±1.0%
	LINE REGULATION	±1.0%	±1.0%	±1.0%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%	±1.0%	±0.5%	±0.5%
	SETUP, RISE TIME	1000ms, 20ms				
HOLD UP TIME(Typ.)	100ms at full load					
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC				
	FREQUENCY RANGE	47 ~ 63Hz				
	EFFICIENCY(Typ.)	70%	75%	75%	76%	76%
	AC CURRENT (Typ.)	0.15A/115VAC 0.07A/230VAC				
	INRUSH CURRENT (Typ.)	COLD START 30A/230VAC				
	LEAKAGE CURRENT	<0.5mA / 240VAC				
PROTECTION	OVER LOAD	Above 105% rated output power Protection type : Hiccup mode, recovery automatically after fault condition is removed				
	OVER VOLTAGE	5.75 ~ 6.75V	13.8 ~ 16.2V	17.2 ~ 20.2V	27.6 ~ 32.4V	55.2 ~ 64.8V
		Protection type : shut off o/p voltage, clamping by zener diode				
	OVER TEMPERATURE	Tj 140℃ typically (U1) Detect on main control IC Protection type : Hiccup mode, recovery automatically after fault condition is removed				
ENVIRONMENT	WORKING TEMP.	-10 ~ +60℃ (Refer to output load derating curve)				
	WORKING HUMIDITY	20 ~ 90% RH non-condensing				
	STORAGE TEMP., HUMIDITY	-20 ~ +85℃, 10 ~ 95% RH				
	TEMP. COEFFICIENT	±0.05%/℃ (0 ~ 50℃)				
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, Period for 60min.each along X, Y, Z axes				
SAFETY & EMC (Note 4)	SAFETY STANDARDS	EN60950-1 CB Approved by TUV				
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC				
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms/500VDC				
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B				
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3				
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11 Light industry level, criteria A				
OTHERS	MTBF	1271.1Khrs min. MIL-HDBK-217F(25℃)				
	DIMENSION	75*40*20mm (L*W*H)				
	PACKING	0.05Kg; 120pcs/6.25Kg/1CUFT				
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.					

Mechanical Specification

Unit:mm



AC Input Connector (CN2) : Molex 5285-03 or equivalent

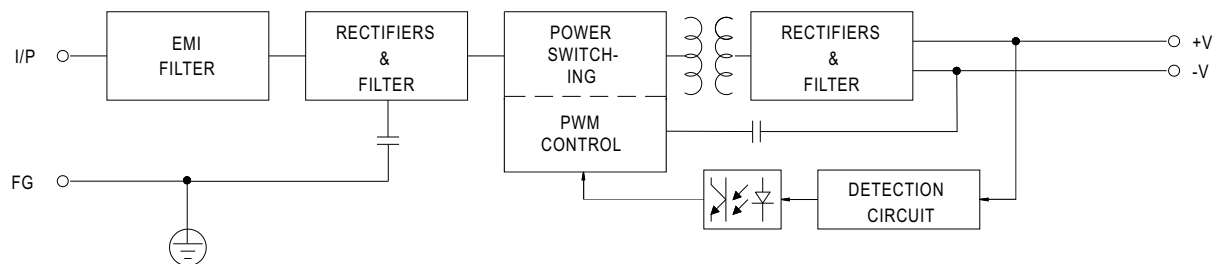
Pin No.	Assignment	Mating Housing	Terminal
1	FG $\perp$	Molex 5058 or equivalent	Molex 2478 or equivalent
2	AC/N		
3	AC/L		

DC Output Connector (CN1) : Molex 5273-02 or equivalent

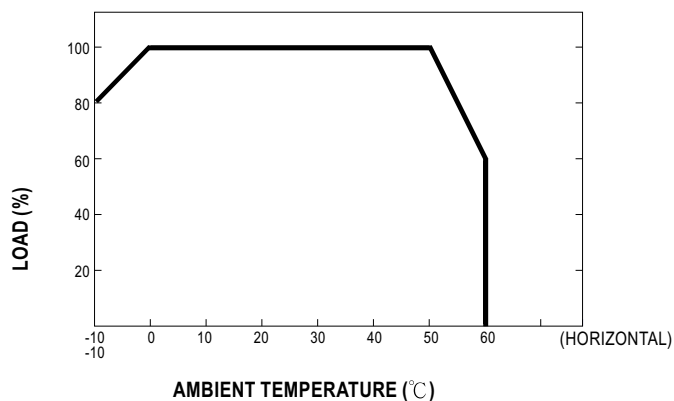
Pin No.	Assignment	Mating Housing	Terminal
1	+V	Molex 5195 or equivalent	Molex 5194 or equivalent
2	-V		

Block Diagram

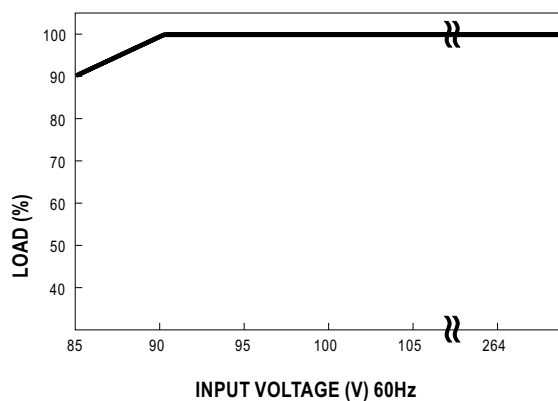
fosc : 67KHz



Output Derating



Static Characteristics



MODEL : PS-05-12

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 36 mVp-p	P
2	OUTPUT VOLTAGE TOLERANCE	V1: -2 %~ 2% (Max)	I/P: 85 VAC / 264 VAC O/P:FULL/ 0% LOAD Ta:25°C	V1: 0%~0.06 %	P
3	LINE REGULATION	V1: -1 %~ 1% (Max)	I/P: 85 VAC ~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ 0 %	P
4	LOAD REGULATION	V1: -1 %~ 1% (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0 %~ 0 %	P
5	SET UP TIME	230VAC/1000 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230 VAC/767 ms	P
6	RISE TIME	230VAC/ 20 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 9.42 ms	P
7	HOLD UP TIME	230VAC/ 100 ms (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 164 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: 1.67 %	P
9	DYNAMIC LOAD	V1: 1200 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	166 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	85 VAC~ 264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	49.925 V~ 264 V	P
			I/P: LOW-LINE-3V=82 V HIGH-LINE+15%= 300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P: 85 VAC ~264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	75% (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	76.17%	P
4	INPUT CURRENT	230 V/ 0.07 A (Max) 115 V/ 0.15 A (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I =0.0704 A/ 230VAC I =0.107 A/ 115VAC	P
5	INRUSH CURRENT	230 V/ 30 A (Max) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 19.39 A/ 230VAC	P
6	LEAKAGE CURRENT	< 0.5 mA / 240VAC	I/P: 254 VAC O/P:Min LOAD Ta:25°C	L-FG: 0.17 mA N-FG: 0.18 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	above 105%	I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C	277 %/ 230VAC 217 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 13.8 V~ 16.2 V	I/P: 230 VAC O/P:MIN LOAD Ta:25°C	15V	P
3	OVER TEMPERATURE PROTECTION	SPEC: Tj 140 typically (U1) Detect on main control IC	I/P: 230 VAC O/P:FULL LOAD	O.T.P. Active Hiccup mode ,recovery automatically after fault condition is removed	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE Hiccup Mode	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																							
1	TEMPERATURE RISE TEST	MODEL : PS-05-24 1. ROOM AMBIENT BURN-IN : 1HRS I/P: 230 VAC O/P: 100% LOAD Ta= 28.9 °C 2. HIGH AMBIENT BURN-IN : 3HRS I/P: 230 VAC O/P: 100% LOAD Ta= 51.3 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 28.9 °C</th><th>HIGH AMBIENT Ta= 51.3°C</th></tr><tr><td>1</td><td>LF1</td><td>LF505</td><td>42.5°C</td><td>56.4°C</td></tr><tr><td>2</td><td>U1</td><td>DM311</td><td>59.5°C</td><td>75.3°C</td></tr><tr><td>3</td><td>C5</td><td>22U/400V CAPXON 105°C KM</td><td>40.2°C</td><td>53.9°C</td></tr><tr><td>4</td><td>BD1</td><td>SINB</td><td>44.5°C</td><td>57.9°C</td></tr><tr><td>5</td><td>ZD1</td><td>P6KE200</td><td>65.7°C</td><td>74.0°C</td></tr><tr><td>6</td><td>D1</td><td>BYV26C 1A/600V PH</td><td>56.7°C</td><td>69.2°C</td></tr><tr><td>7</td><td>TI COIL</td><td>TF-998ZY</td><td>62.7°C</td><td>73.1°C</td></tr><tr><td>8</td><td>C7</td><td>47U/50V CAPXO 105°C GL</td><td>46.9°C</td><td>62.3°C</td></tr><tr><td>9</td><td>C11</td><td>100U/35V CAPXON 105°C GL</td><td>43.9°C</td><td>58.8°C</td></tr><tr><td>10</td><td>D10</td><td>SB540 5A/40V LT</td><td>54.0°C</td><td>64.7°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 28.9 °C	HIGH AMBIENT Ta= 51.3°C	1	LF1	LF505	42.5°C	56.4°C	2	U1	DM311	59.5°C	75.3°C	3	C5	22U/400V CAPXON 105°C KM	40.2°C	53.9°C	4	BD1	SINB	44.5°C	57.9°C	5	ZD1	P6KE200	65.7°C	74.0°C	6	D1	BYV26C 1A/600V PH	56.7°C	69.2°C	7	TI COIL	TF-998ZY	62.7°C	73.1°C	8	C7	47U/50V CAPXO 105°C GL	46.9°C	62.3°C	9	C11	100U/35V CAPXON 105°C GL	43.9°C	58.8°C	10	D10	SB540 5A/40V LT	54.0°C	64.7°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230VAC O/P: 120% LOAD Ta:25°C	TEST : OK	P																																																							
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100 % LOAD Ta= -10°C	TEST : OK	P																																																							
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK	P																																																							
5	TEMPERATURE COEFFICIENT	± 0.05 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.02 %(0~50°C)	P																																																							
6	VIBRATION TEST	1 Carton & 1 Set Operating at I/P: VAC NO LOAD (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25°C		TEST : OK	P																																																							

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min	I/P-O/P: 3 KVAC/min Ta:25℃	I/P-O/P: 1.2 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25℃	I/P-O/P: 15.3 G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	6 mΩ	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25℃	PASS	P

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	PS-05-24: SUPPOSE C11 IS THE MOST CRITICAL COMPONENT I/P : 230VAC O/P : FULL LOAD Ta= 25 ℃ LIFE TIME= 331538 HRS I/P : 230 VAC O/P : FULL LOAD Ta=50 ℃ LIFE TIME= 98571 HRS			P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2004/12/24	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG

2005/09/10 A40-G022